(19) World Intellectual Property Organization International Bureau



(43) International Publication Date 4 May 2006 (04.05.2006) (10) International Publication Number WO 2006/046768 Al

(51) International Patent Classification:

HOIL 21/268 (2006.01) HOIL 21/336 (2006.01)

HOIL 21/20 (2006.01) HOIL 29/786 (2006.01)

(21) International Application Number:

PCT/JP2005/020166

(22) International Filing Date: 27 October 2005 (27.10.2005)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 2004-317057

29 October 2004 (29. 10.2004) JI

- (71) Applicant (for all designated States except US): SEMI-CONDUCTOR ENERGY LABORATORY CO., LTD. [JP/JP]; 398, Hase, Atsugi-shi, Kanagawa, 2430036 (JP).
- (72) Inventors: and
- (75) Inventors/Applicants (for US only): TANAKA, Kolchiro [JP/JP]; c/o SEMICONDUCTOR ENERGY LABORATORY CO., LTD., 398, Hase, Atsugi-shi, Kanagawa, 2430036 (JP). YAMAMOTO, Yoshiaki [JP/JP]; c/o SEMICONDUCTOR ENERGY LABORATORY CO., LTD., 398, Hase, Atsugi-shi, Kanagawa, 2430036 (JP).

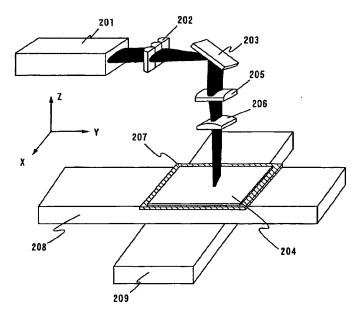
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: LASER IRRADIATION APPARATUS AND LASER IRRADIATION METHOD



(57) Abstract: It is an object of the present invention to provide a laser irradiation apparatus and a laser irradiation method which can conduct a laser process homogeneously to the whole surface of a semiconductor film. A laser beam oscillated from a laser crystal having a wide wavelength range and a beam homogenizer are used. Since the laser beam having a wide wavelength range has low coherency, an interference pattern does not appear on a semiconductor film. Moreover, a linear beam having a length of several meters or more in its major axis can be formed, which increases throughput of a laser anneal process.